ON A NEW SPECIES OF OENETUS (LEPIDOPTERA, FAMILY HEPIALIDAE) DAMAGING EUCALYPTUS SAPLINGS IN TASMANIA

By NORMAN B. TINDALE *

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SUMMARY

A new moth of the family Hepialidae, *Oenetus paradiseus* Tindale, is described from Tasmania, where it has been found causing some damage to *Eucalyptus* saplings. The harm is accentuated by the injuries caused by black cockatoos (*Calyptorhynchus funereus*), when they are feeding on the larvae and pupae of the moth.

Interaction of moth and cockatoo evidently plays an important part in the natural culling of sapling eucalypts.

A second race of the same species, *Oenetus p. montanus* Tindale, is recorded from snow gums (*Eucalyptus niphophila*) on Mt. Gingera in the Federal Capital Territory.

INTRODUCTION

In September, 1952, Mr. L. W. Miller, Chief Entomologist of the Department of Agriculture, Hobart, submitted to me for identification a male and two females of a Hepialid moth which had been bred from *Eucalyptus* seedlings at Taranna, Tasmania. Researchers of the Commonwealth Forestry Bureau there have been making growth studies of Eucalypts under forest conditions. They have been employing plots carrying different population densities of trees.

To obtain the initial desired densities naturally regenerating saplings were thinned out, down to definite numbers per acre.

The Oenetus grubs were found to be present in numbers of the trees, and although the insects themselves did not seem to do enough damage seriously to affect tree growth, they were noticed to be particularly attractive to black cockatoos, *Calyptorhynchus funereus* Shaw, which are very common in the area. In getting the grubs out of the wood the cockatoos gouge out very large holes, often damaging the saplings so that they weakened and broke off during heavy winds. These injuries reduced the planned numbers of trees in the artificial thinning experiment, thereby incidentally drawing attention to the natural culling of *Eucalyptus* saplings effected by the interaction of the Hepialid grubs and the black cockatoos.

Oenetus paradiseus sp. nov.

Pl. vi, fig. 3-4

Male—Head small, eyes normal; antennae short, slender, tapering, smooth, brown; head and thorax smooth, clothed in dull green hairs, abdomen purplish-brown, fore- and mid-legs green, hind-legs purplish-brown with a tuft of yellow sex hairs. Forewings purplish-brown with traces of darker brown markings and some scattered tufts of not very noticeable dull green scales usually forming a series of patches in the central portion of the wing; cilia very short, concolorous with rest of wing. Hindwings with basal two-thirds brilliant red, apex and termen broadly, and area at hinder angle and fringes less conspicuously, dull black; hairs at base of wing and base of abdomen red. Wings beneath bright red on basal half, distally dull black. Forewing length 24 mm., expanse 54 mm.

Female—Antennae similar to those of male, but shorter; head and thorax bright green; abdomen towards apex bright bluish-green, changing to a dull fawn

* S.A. Museum.

near base, with basal hairs almost pink. Forewings bluish-green with a marginal band of pale pink from apex to inner margin, also two transverse rows of pink spots from just below apex to inner margin at one-half. Hindwings salmon pink, lighter towards termen, with a marginal band of dull fawn at inner angle. Forewing length 35 mm.; expanse 77 mm.

Loc.—Tasmania: Ridgeway (Holotype, a male, dated 4 October 1948 and allotype female 12 October 1948, taken by J. R. Cunningham, in the Tasmanian Museum, Hobart; a paratype pair taken 4 October 1948, numbered I. 19099 in South Australian Museum; paratypes, from same locality, in collections of Messrs. J. R. Cunningham, F. E. Wilson).; also from Taranna (a paratype male and two females, emerged 28 August 1952, reared by L. W. Miller from larvae found boring in *Eucalyptus* saplings on 24 April 1952). Other examined specimens were a pair from Tasmania submitted by the late Mr. G. Lyell and two paratype females, labelled "Tasmania" formerly in the J. A. Kershaw collection and now passed to the National Museum, Melbourne; there is one male, without locality label, in the Queen Victoria Museum, Launceston.

There are four males and a female from Ridgeway, Tasmania, in the F. M. Angel collection, including a pair bred out on 15 September 1950; one taken 16 September 1950 by S. Angel, and two males dated 7 September 1949 taken by Miss M. Tagg.

Thirteen males, 11 females examined.

In the Taranna male, as also in one of the Ridgeway examples, the brown of the forewings is in certain lights tinged dull green. The Taranna females have the faded-scarlet markings of forewing rather larger than in some Ridgeway examples.

For colour contrasts this pair of moths is not equalled in the genus *Oenetus* and the colours themselves are most brilliant. Hence there is little need to apologise for *O. paradiseus* as the chosen name.

The male is distinctive by reason of its fiery red hindwings with broad black outer margins. The female is equally distinctive with its bluish-green forewings and pink or faded scarlet margins and spots.

The species falls into that section of the genus *Oenetus* in which the eyes of the males are not hypertrophied, but are of normal form and proportions, as in the female. In this character the species is most nearly related to *O. scotti* Scott, particularly resembling that species in the general shape of the wings; the colours and markings of course bear little resemblance.

A pair of *O. scotti* Scott, from Brisbane, Queensland are figured (pl. vi, fig. 1-2) for comparison with the new species. In *O. scotti* the head, thorax and extremity of abdomen are bright green, the forewings also are green with brown markings; the hindwings are yellow at tips, and pink towards base; the base of abdomen also is clothed in pink hairs and scales.

I am indebted to Mr. L. W. Miller for sending the material of *O. paradiseus* which stimulated the writing of this paper in its present form, and to Mr. J. R. Cunningham for the gift of the pair in the South Australian Museum collection.

In October 1948 Mr. J. R. Cunningham bred out both sexes of this species from pupae he found in *Eucalyptus* saplings at Ridgeway, Tasmania. The late Mr. George Lyell of Gisborne, at about the same time, sought my opinion as to the identification of specimens sent to him also from Tasmania.

The species was already known to me, for some years previously the late Mr. J. A. Kershaw had submitted examples of the species; his series consisted of two faded females, labelled merely as from "Tasmania". An example of the male, without locality label, was in the Queen Victoria Museum, Launceston.

The species appeared then to be new, and a preliminary description was drafted but put aside pending a general revision of the genus. At this time there

were several described species, of which the types are preserved in overseas Museums and of which authentically identified material was not locally available. In the intervening time much of the data for such a revision has been brought to hand and the study is well advanced.

The present paper anticipates the Revision in order to provide a name for the species, which thus suddenly has become of interest to the forester and of possible minor economic importance because of its association with cultivated forest Eucalypts.

The interplay of cockatoos and Hepialid grubs may be of importance to the forester elsewhere. Only a few days after the above paragraph was drafted Mr. I. F. B. Common, of the Division of Entomology, C.S.I.R.O., Canberra, wrote to me under date of 20 October 1952:—"About a fortnight ago I was intrigued to find that black cockatoos had been biting large pieces out of snow gum saplings near Mt. Gingera to obtain larvae and pupae of a Hepialid. A search revealed that pupae of the moth were quite common, and I have brought back a number of sticks to rear the adults. . . . . I was wondering if you have any records of a species from snow gums at about 5,500 feet."

While this paper was going through the press, Mr. I. F. B. Common sent me for examination four males and four females of the Mt. Gingera form. These prove to be the same species but distinguishable, in the male, by the somewhat less fiery red colour of hindwings. This colour extends almost to the margins on the middle third of the wing instead of being separated from it by a rather wide black marginal band. The females usually tend to have a more noticeable greenish suffusion on the outer third of hindwing. This racially distinct form may be known as **O. p. montanus** subsp. nov. The specimens were reared from pupae gathered on Mt. Gingera, F.C.T., at 5,500 ft.; they emerged on 25 and 26 October 1952. The holotype male and allotype female have been returned, together with a paratype pair, to the C.S.I.R.O. Division of Entomology, Canberra, a paratype pair being retained for the South Australian Museum collection (I. 19100) and another pair for the British Museum.

Mr. Common writes:—"Although the moths emerged in late October in the laboratory, general observations in the field suggest that they probably emerge a week or two later at outdoor temperatures at that altitude. The damage to the tree trunks of the snow gums has been noticed at several localities along the Brindabella Range (of which Mt. Gingera is a part) above about 4,500 feet. Saplings with trunks from about $\frac{3}{4}$ inch to 3 or 4 inches are attacked and, again from general observations, I would say the larvae have at least a two-year (or perhaps even a three-year) life cycle. At the time the pupae were collected in mid-October, there were also quite immature larvae.

The exit hole is usually quite inconspicuous and is often at the base of and on the upper side of an upwardly oblique branch. Beneath the bark and around the exit hole a hollow of variable size is usually found. This is apparently eaten out by the larva. While the larva is still feeding, the exit hole is covered by a small amount of firm webbing into which is woven particles of wood". Mr. Common suggests that the amount of webbing is less than in species such as *O. daphnandrae* Lucas and *O. eximia* Scott and that in contrast with these species the plug formed when the larva is about to pupate is not a thin horizontal membrane of silk scarcely visible from outside the hole, but is a "plug clearly visible from without as a vertical or slightly oblique whitish silken membrane."